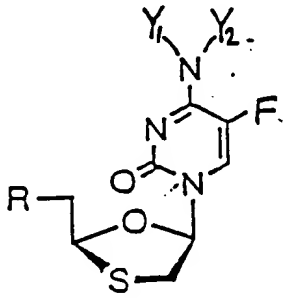
WHAT IS CLAIMED IS:

1. 2'-Deoxy-5-fluoro-3'-thiacytidine in the form of a racemic mixture or a single isomer and pharmaceutically acceptable derivatives thereof.

2. Substituted 2'-deoxy-5-fluoro-3'-thiacytidine having the formula:



wherein Y_1 and Y_2 are selected from the group consisting of H, alkyl, substituted alkyl, cycloaklyl and acyl; and

R is selected from the group consisting of H, hydroxyl, and oxyacyl

in the form of a racemic mixture or a single isomer and pharmaceutically acceptable derivatives thereof.

3. A compound selected from the group consisting of 4-N-acetyl-2'-deoxy-5-fluoro-3'-thiacytidine; 4-N-acetyl-5'-butyryl-2'-deoxy-5-fluoro-3'-thiacytidine; and 5'-butyryl-2'-deoxy-5-fluoro-3'-thiacytidine in the form of a racemic mixture or a single isomer and pharmaceutically acceptable derivatives thereof.

4. The 2'-deoxy-5-fluoro-3'-thiacytidine of Claim 1 in a pharmaceutically accepted carrier.

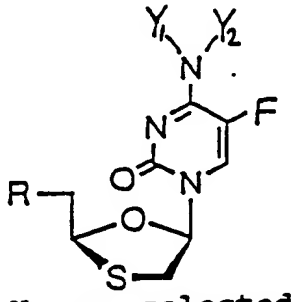
5. The substituted 2'-deoxy-5-fluoro-3'-thiacytidine of Claim 2 in a pharmaceutically accepted carrier.

6. The 2'-deoxy-5-fluoro-3'-thiacytidine of Claim 1, wherein the single isomer is the ß-isomer.

7. The substituted 2'-deoxy-5-fluoro-3'-thiacytidine of Claim 2, wherein the single isomer is the ß-isomer.

8. A pharmaceutical formulation comprising the ß-isomer of 2'-deoxy-5-fluoro-3'-thiacytidine or a pharmaceutically acceptable derivative thereof together with a pharmaceutically acceptable carrier.

9. A pharmaceutical formulation comprising the ß-isomer of a substituted 2'-deoxy-5-fluoro-3'-thiacytidine having the formula:



wherein Y_1 and Y_2 are selected from the group consisting of H, alkyl, substituted alkyl, cycloalkyl and acyl; and

R is selected from the group consisting of H, hydroxyl and oxyacyl

or pharmaceutically acceptable derivatives thereof together with a pharmaceutically acceptable carrier.

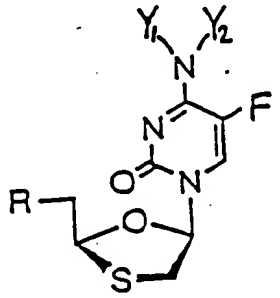
10. The pharmaceutical formulation of Claim 9, wherein the ß-isomer of a substituted 2'-deoxy-5-fluoro-3'-thiacytidine is selected from the group consisting of 4-N-acetyl-2'-deoxy-5-fluoro-3'-thiacytidine; 4-N-acetyl-5'-butyryl-2'-deoxy-5-fluoro-3'-thiacytidine; and 5'-butyryl-2'-deoxy-5-fluoro-3'-thiacytidine.

11. A method for treating or preventing HIV infection comprising administering to a human a pharmaceutical formulation comprising an effective amount of the ß-isomer of 2'-deoxy-5-fluoro-3'-thiacytidine or a pharmaceutically acceptable derivative thereof together with a pharmaceutically acceptable carrier.

12. The method of Claim 11, wherein the pharmaceutically acceptable derivative comprises a monophosphate, diphosphate, or triphosphate ester of 2'-deoxy-5-fluoro-3'-thiacytidine.

13. The method of Claim 11, wherein the pharmaceutically acceptable carrier comprises a liposomal suspension.

14. A method for treating or preventing HIV infection comprising administering to a human a pharmaceutical formulation comprising an effective amount of a ß-isomer of a substituted 2'-deoxy-5-fluoro-3'-thiacytidine having the formula:



wherein Y_1 and Y_2 are selected from the group consisting of H, alkyl, substituted alkyl, cycloalkyl and acyl; and

R is selected from the group consisting of H, hydroxyl and oxyacyl

or pharmaceutically acceptable derivatives thereof together with a pharmaceutically acceptable carrier.

15. The method of Claim 14, wherein the substituted 2'-deoxy-5-fluoro-3'-thiacytidine is selected from the group consisting of the monophosphate, diphosphate, and triphosphate ester of 2'-deoxy-5-fluoro-3'-thiacytidine.

16. The method of Claim 14, wherein the pharmaceutically acceptable carrier comprises a liposomal suspension.

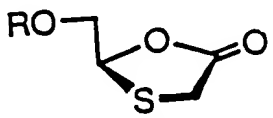
17. The method of Claim 14, wherein the ß-isomer of the substituted 2'-deoxy-5-fluoro-3'-thiacytidine is selected from the group consisting of 4-N-acetyl-2'-deoxy-5-fluoro-3'-thiacytidine; 4-N-acetyl-5'-butyryl-2'-deoxy-5-fluoro-3'-thiacytidine; and 5'-butyryl-2'-deoxy-5-fluoro-3'-thiacytidine.

18. A method of inhibiting the reverse transcription of the RNA of a human immunodeficiency virus in a cell infected with the virus comprising contacting the cell with the composition of Claim 1.

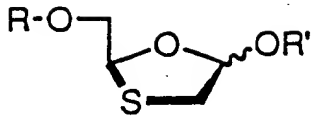
19. A method of inhibiting the reverse transcription of the RNA of a human immunodeficiency virus in a cell infected with the virus comprising contacting the cell with the composition of Claim 2.

20. A method of preparing a prodrug analogue of the ß-isomer of 2'-deoxy-5-fluoro-3'-thiacytidine comprising the steps of:

(a) reducing a lactone having the formula:



wherein R is a protecting group, to form a carboxylate, the carboxylate having the formula:

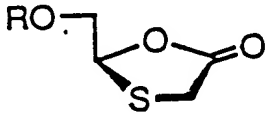


wherein R' is an acyl group; and

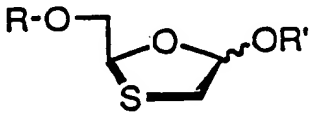
(b) coupling said carboxylate with a silyated cytosine fluoro substituted at the 5-position in the presence of an effective amount of $SnCl_4$ to form the ß-isomer of a 5'-substituted 2'-deoxy-5-fluoro-3'-thiacytidine prodrug analogue.

21. A method of preparing the ß-isomer of 2'-deoxy-5-fluoro-3'-thiacytidine comprising the steps of:

(a) reducing a lactone having the formula:



wherein R is a protecting group, to form a carboxylate, the carboxylate having the formula:



wherein R' is an acyl group;

(b) coupling said carboxylate with a silyated cytosine fluoro substituted at the 5-position in the presence of an effective amount of $SnCl_4$ to form the ß-isomer of a 5'-substituted 2'-deoxy-5-fluoro-3'-thiacytidine; and

(c) replacing the protecting group with a hydrogen to form the ß-isomer of 2'-deoxy-5-fluoro-3'-thiacytidine.

22. The method of Claim 21 and further comprising the step of substituting an oxyacl group at the 5'-position of the ß-isomer of 2'-deoxy-5-fluoro-3'-thiacytidine to form a prodrug analogue of 2'-deoxy-5-fluoro-3'-thiacytidine.

23. The method of Claim 21, wherein said protecting group is selected from the group consisting essentially of alkyl, silyl, and acyl.